OPERATING SUMMARY

ONTARIO MINISTRY OF ENVIRONMENT
3693600002321 4

PORT DOVER

water pollution control plant

1968

TD
367
.A56
P676
1968
MOE

12. *

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
367
.A56
P676
1968

Port Dover : water pollution control plant.

81240

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

D. S. Caverly,
General Manager.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
Dr. James A. Vance

VICE-CHAIRMAN
J. H. H. Root, M. P. P.

COMMISSIONERS
H. E. Brown
D A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D S. Caverly

ASSISTANT GENERAL MANAGERS
L. E. Owers
K. H Sharpe
F A. Voege
A K Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McTavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
R. E. Brown

135 St. Clair Avenue West
Toronto 7

PORT DOVER

water pollution control plant

operated for

THE TOWN OF PORT DOVER

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

Environment Ontario
Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M9P 3V6
Canada

Digitized by the Internet Archive
in 2015

https://archive.org/details/portdoverwaterpo23214

FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

CONTENTS

Title Page i

Foreword ii

'68 Review 1

Project Costs 2

Operating Costs 3

Process Data 5

Conclusions . . . . . Inside back cover

'68 REVIEW

The total operating cost for the year was $23,368.29 representing a cost of $190.61 per million gallons of sewage treated. The unit costs of treating 1 lb. of BOD decreased from 21 cents in 1967 to 12 cents in 1968.

The average sewage flow was 0.335 mgd which is approximately 16% of the design capacity of 2.1 mgd. The design flow was never exceeded. The average raw sewage strengths for BOD and suspended solids were 298 mg/l and 203 mg/l respectively and the final effluent BOD and suspended solids strengths were 142 mg/l and 56 mg/l respectively, giving removal efficiencies of 51% in BOD and 72% in suspended solids.

This project was operated and maintained by two men, the chief operator and an operator. Casual labour was utilized during the summer months to provide vacation relief. Project supervision is based on a single eight-hour shift week days and two-hour supervision on holidays and weekends.

PROJECT COSTS

NET CAPITAL COST (Final)	$684,451.08
DEDUCT - Portion Financed by CMHC-MDLB (Final)	463,731.87
Long Term Debt to OWRC	$220,719.21
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	$ 23,766.99
Net Operating	$ 23,368.29
Debt Retirement	4,455.00
Reserve	4,155.85
Interest Charged	12,391.93
TOTAL	$ 44,371.07

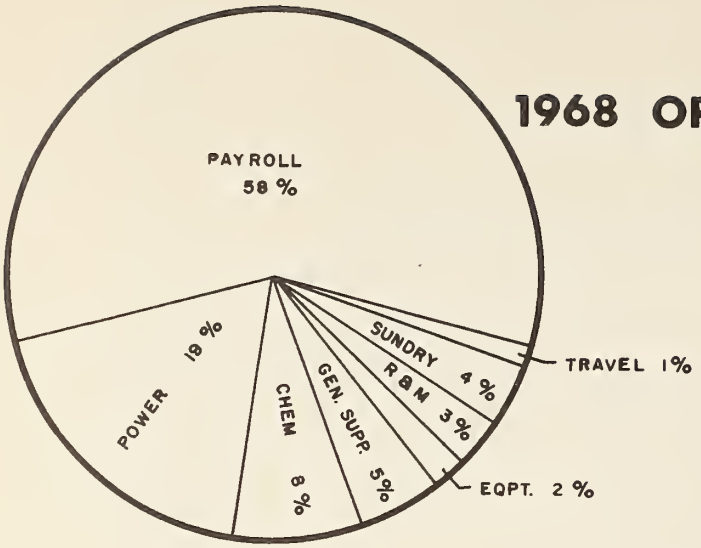
RESERVE ACCOUNT

Balance at January 1, 1968	$ 17,093.15
Deposited by Municipality	4,155.85
Interest Earned	1,106.07
	$ 22,355.07
Less Expenditures	-
Balance at December 31, 1968	$ 22,355.07

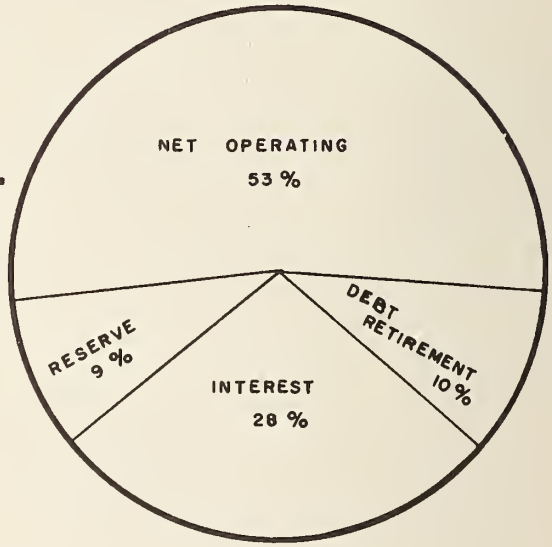
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER	TRAVEL
JAN	1066.22	930.54	-	-	-	-	19.00	-	103.50	13.18	-	-
FEB	2088.82	905.66	-	-	482.33	101.72	110.00	375.51	113.60	-	-	-
MAR	2229.53	1444.22	-	-	483.51	101.73	116.54	13.55	11.66	58.32	-	-
APRIL	1355.28	914.43	-	-	387.30	-	19.00	-	34.55	-	-	-
MAY	1571.95	905.66	-	-	432.71	-	122.52	-	-	-	-	-
JUNE	1891.32	923.21	72.88	-	136.40	596.54	82.29	-	80.00	-	-	-
JULY	1785.11	929.74	72.88	-	546.60	-	95.23	-	-	48.68	-	91.98
AUG	2214.74	1364.00	243.90	-	385.32	-	64.36	-	154.36	-	-	2.80
SEPT	1947.62	894.64	178.33	-	332.97	357.93	121.12	-	35.44	27.19	-	-
OCT	1659.48	914.01	-	-	320.27	286.34	112.24	-	3.00	23.62	-	-
NOV	2003.91	954.65	-	-	328.31	-	122.03	-	-	598.92	-	-
DEC	3554.31	2108.65	-	-	615.48	393.25	190.60	-	38.66	45.13	-	162.54
TOTAL	23368.29	13189.41	567.99	-	4451.20	1837.51	1174.93	389.06	574.77	926.10	-	257.32

1968 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1965	126.92	$23,343.94	$183.93	9 cents
1966	127.71	23,641.32	185.12	10 cents
1967	114.26	22,671.63	198.42	21 cents
1968	122.53	23,368.29	190.71	12 cents

Process Data

Flows

The average daily flow was 0.335 mgd which is approximately 16% of the design flow of 2.08 mgd. The flows are higher than the 1967 flows due to the inclusion of one industry in late 1967. The maximum day recorded was 1.7 mg or 0.4 mg less than design.

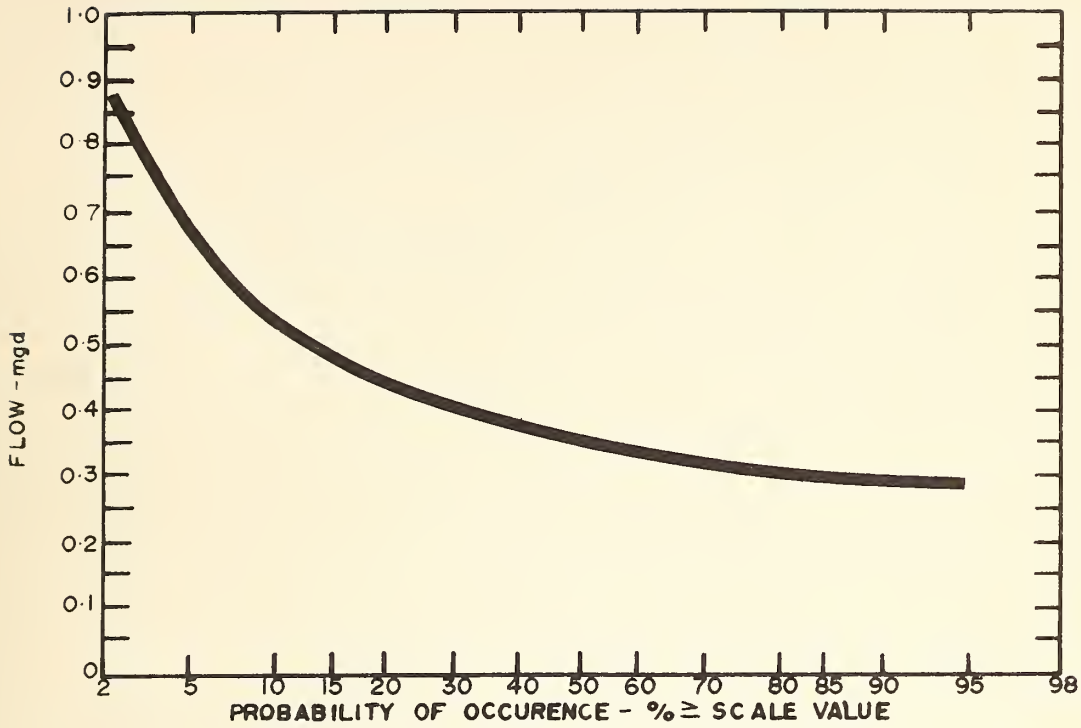
Chlorination

Disinfection of the final effluent by chlorination is practiced April through October to avoid any danger to public health from recreational use of the receiving waters. The total 1968 consumption increased by 43% over 1967 becuase of an increase in BOD loading.

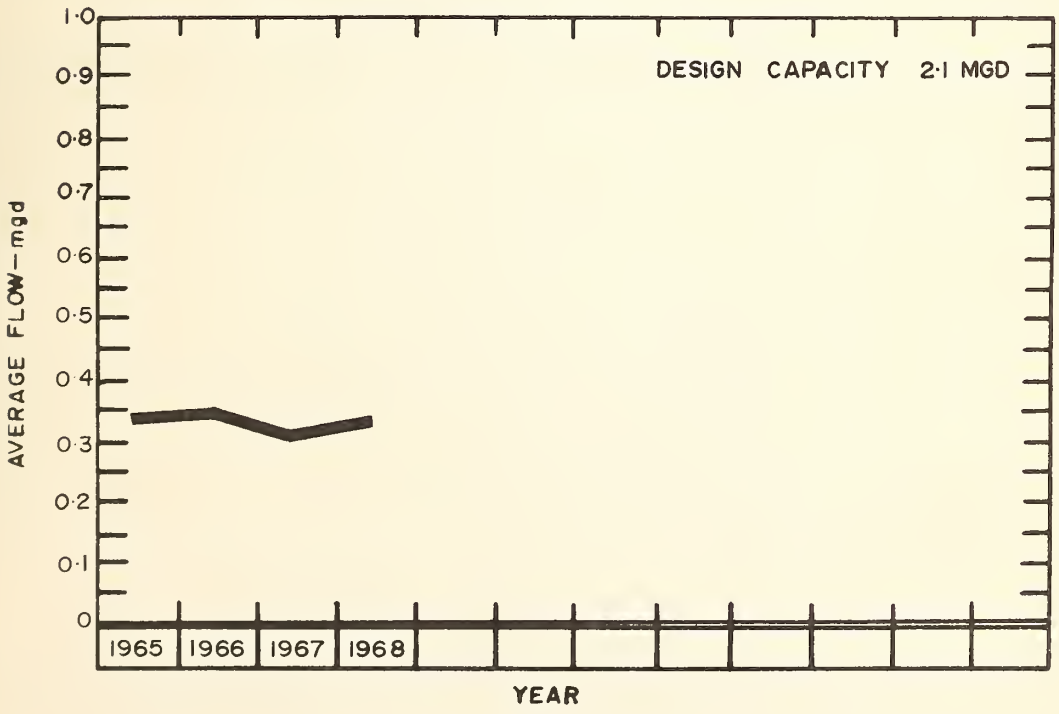
PLANT FLOWS and CHLORINATION

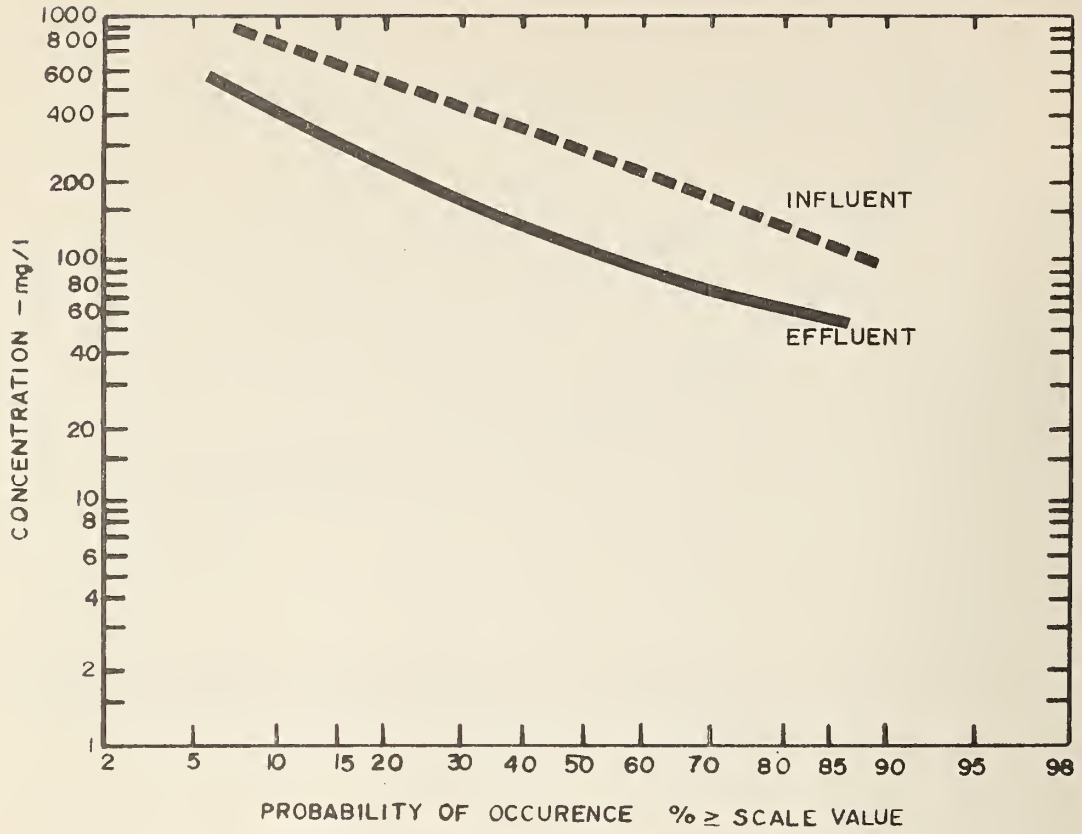
MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10^3 lbs.	DOSAGE mg/l
JAN	8.54	.275	.760	.120	0	0
FEB	9.43	.325	.970	.210	0	0
MAR	10.60	.339	.870	.190	0	0
APR	12.04	.401	.970	.240	0.96	8.0
MAY	9.77	.315	.460	.240	1.09	11.2
JUN	11.43	.381	1.500	.220	1.24	10.2
JUL	11.21	.362	.540	.240	1.84	16.4
AUG	9.16	.296	.430	.220	1.36	14.9
SEPT	8.12	.271	.510	.170	1.81	22.2
OCT	8.68	.280	.660	.170	1.49	17.2
NOV	12.17	.406	1.700	.220	0	0
DEC	11.38	.366	.830	.200	0	0
TOTAL	122.53	-	-	-	9.79	-
AVERAGE	-	.335	-	-	1.40*	13.9*

* During Chlorination Period

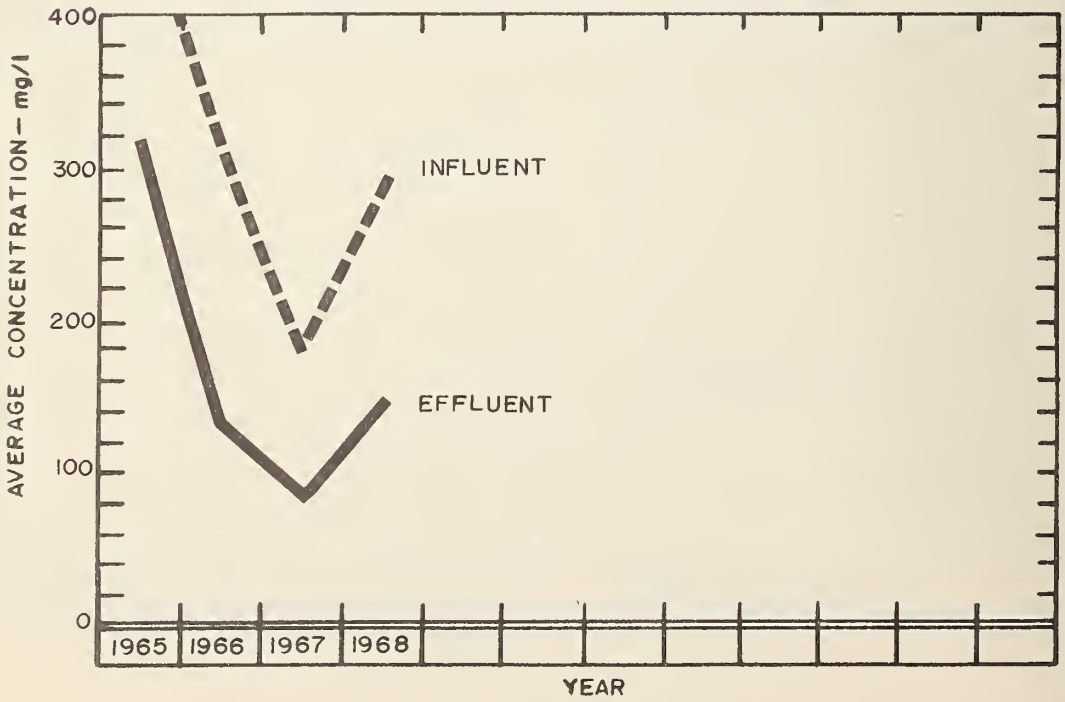

1·0
0·9
0·8
0·7
0·6
0·5
0·4
0·3
0·2
0·1
0
FLOW - mgd
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

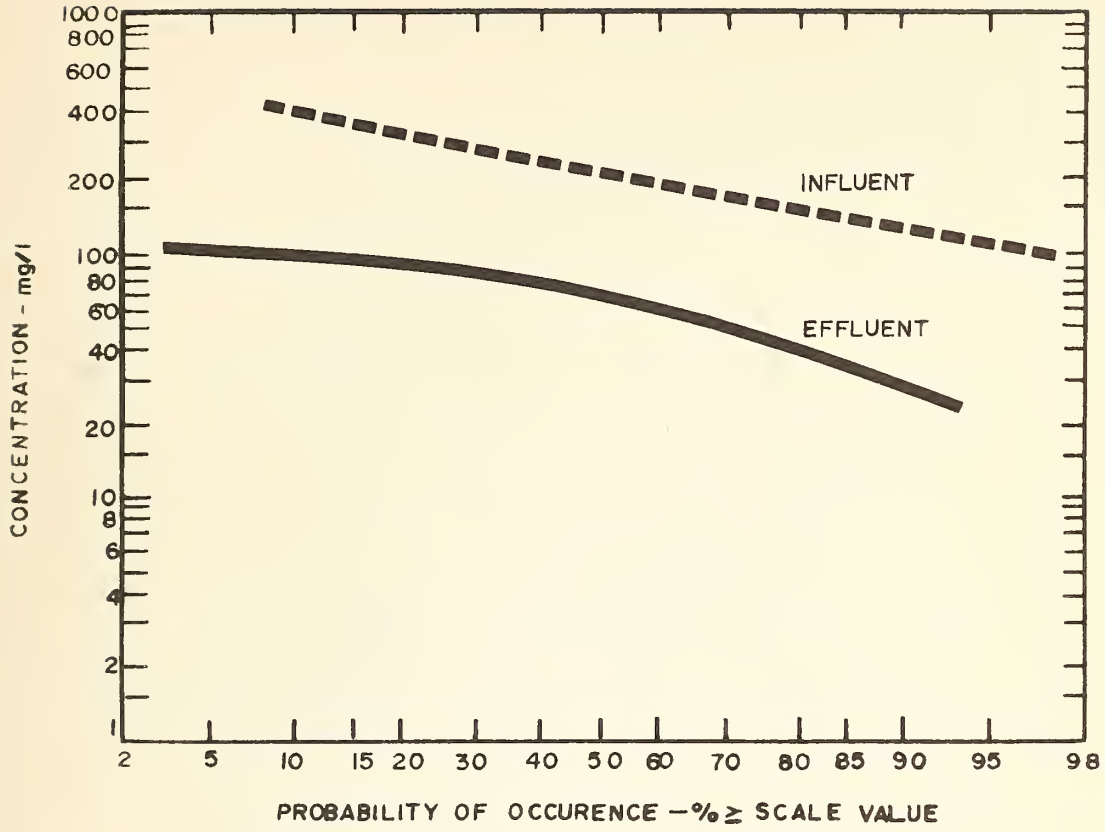
FLOWS


1·0
0·9
0·8
0·7
0·6
0·5
0·4
0·3
0·2
0·1
0
AVERAGE FLOW - mgd
DESIGN CAPACITY 2·1 MGD
1965
1966
1967
1968
YEAR

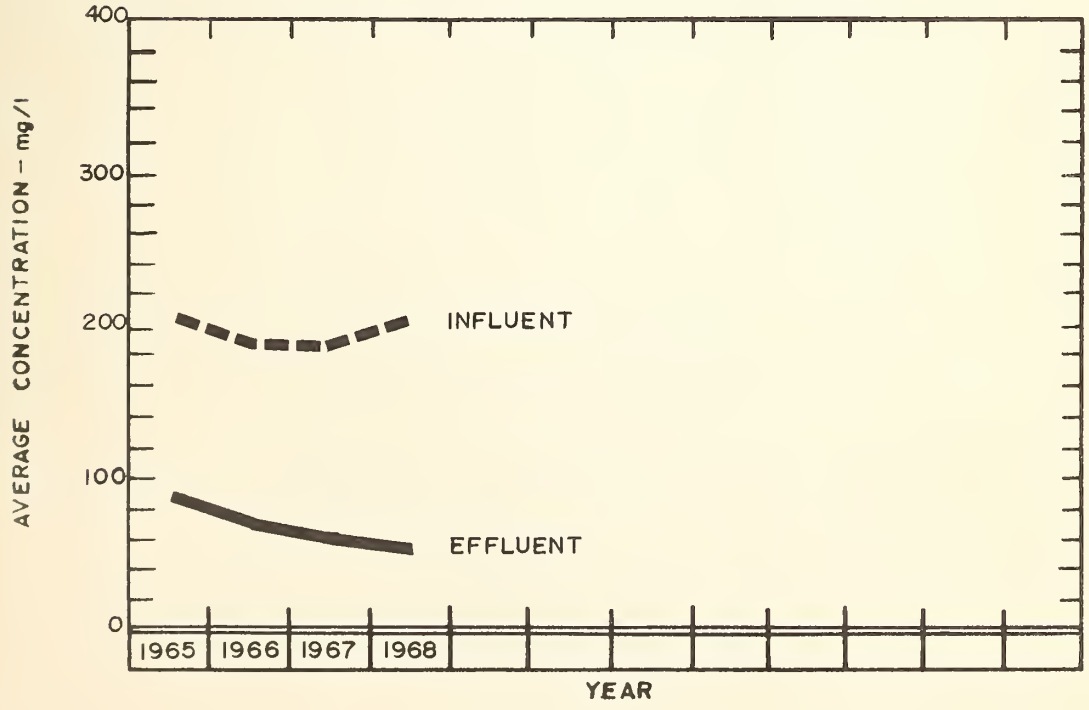


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



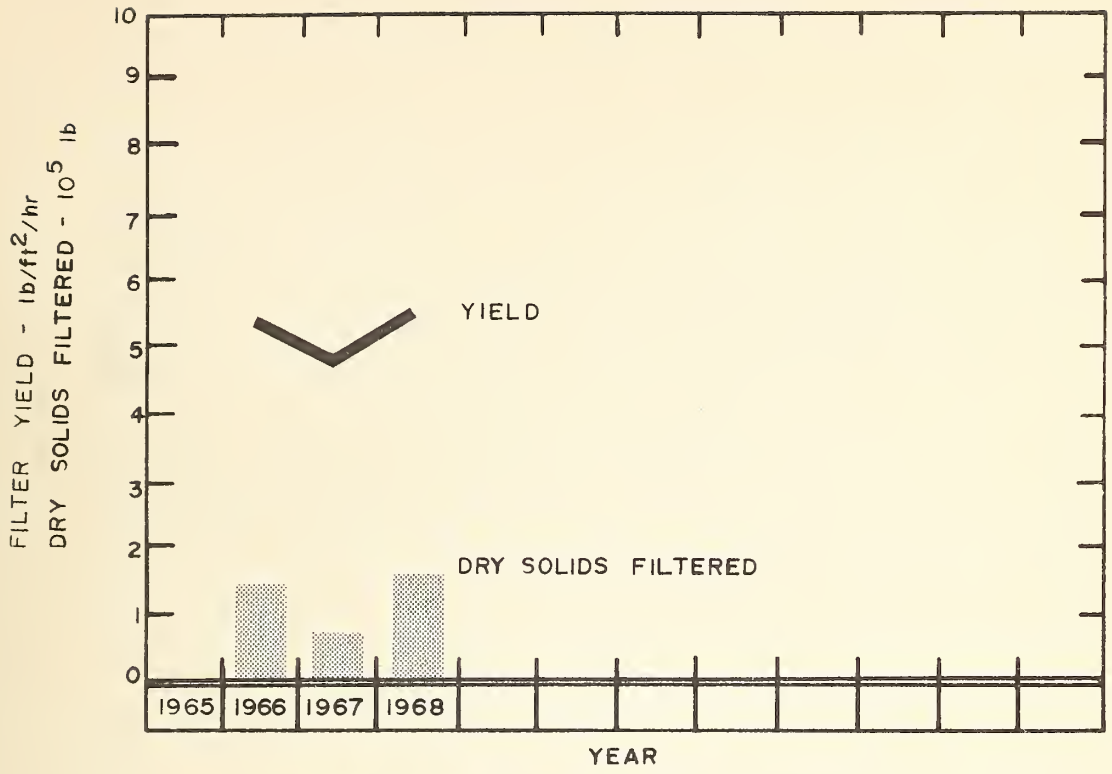
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL 10^3 lb	INF CONC^N mg/l	EFF CONC^N mg/l	RED^N %	REMOVAL 10^3 lb	REMOVAL ft^3
JAN	70	34	51	3.1	87	31	64	4.8	8
FEB	112	58	48	5.1	107	37	65	6.6	-
MAR	75	36	52	4.1	111	36	68	8.0	25
APR	235	95	60	16.9	257	33	87	27.0	27
MAY	305	128	58	17.3	292	56	81	23.1	111
JUN	212	117	45	10.8	195	59	70	15.5	56
JULY	250	199	20	5.7	206	89	57	13.1	6
AUG	560	240	57	29.3	272	84	69	17.2	35
SEPT	600	307	49	23.8	297	79	73	17.7	21
OCT	715	400	44	27.3	353	85	76	23.2	70
NOV	315	70	78	29.8	144	46	68	11.9	30
DEC	129	44	66	9.6	109	31	72	8.8	24
TOTAL	-	-	-	182.8		-	-	176.9	213
AVERAGE	298	145	51	15.2	203	56	72	14.7	34

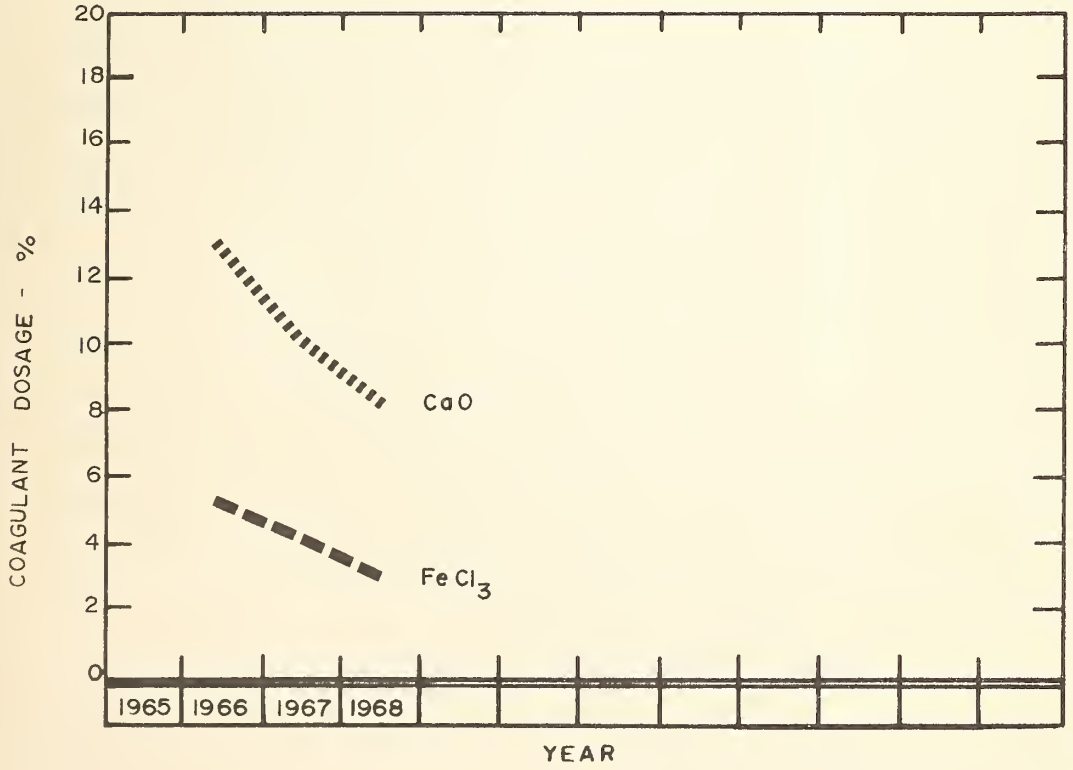
COMMENTS

The average influent BOD and suspended solids was 298 mg/l and 203 mg/l, while the average effluent BOD and suspended solids was 145 mg/l and 56 mg/l respectively. The removal efficiencies for BOD and suspended solids were 51% and 72% respectively, above average for a primary treatment plant.

The grit removed was approximately 1.74 cubic feet per million gallons, which is lower than last year, but within the normal range for sanitary sewage.



VACUUM FILTRATION



VACUUM FILTRATION

MONTH	TOTAL FILTER USE hr	SLUDGE TO FILTER		CONDITIONING CHEMICALS						FILT. CAKE	* FILTR	YIELD
		CONC T.S. %	DRY SOLIDS 10^3 lb	Ca O		Fe Cl_3		POLYMER		T.S %	T.S. %	lb/ft^2 hr
				lb	x %	lb	x %	lb	x ppm			
JAN	12.5	7.7	13.4	140	10.0	57	4.1	14	1160	30	0.3	5.9
FEB	11.5	4.0	8.1	0	-	0	-	8	0090	27	0.5	3.6
MAR	0	-	0	0	-	0	-	0	-	-	-	-
APR	11.0	6.0	9.4	175	4.0	82	1.9	2	502	20	0.8	4.3
MAY	24.0	7.9	28.3	0	-	0	-	3	210	18	0.9	5.7
JUN	10.0	7.6	12.3	0	-	0	-	4	750	20	0.8	6.2
JUL	12.5	9.0	15.4	980	8.3	273	2.3	19	5280	27	1.0	5.7
AUG	12.0	7.5	18.2	1015	5.6	601	3.3	0	-	29	0.9	7.0
SEP	13.0	7.4	12.6	875	6.9	386	3.1	0	-	28	0.9	4.8
OCT	14.0	7.4	11.9	1365	11.5	437	3.7	0	-	30	1.0	5.0
NOV	13.0	10.7	16.3	1575	10.6	382	2.6	8	5340	28	1.0	5.7
DEC	7.0	12.8	10.5	0	0	0	0	7	854	28	0.6	7.5
TOTAL	140.5	-	156.5	6125	-	2218	-	65	-	-	-	-
AVERAGE	12.8	8.0	14.2	-	* 8.1	-	*3.0	-	*1892	26	0.8	5.6

* FILTR. DENOTES FILTRATE PLUS WASH WATER

x DOSAGE WHEN USED

COMMENTS (See next page)

COMMENTS

During 1968 two methods of sludge filtration were used. Conventional chemicals filtered a total of 37.55 tons of dry solids, and polyelectrolytes filtered an additional 30.08 tons. A total of 10.62 tons was filtered without use of flocculating chemicals.

The average yield of 5.6 pounds of dry sludge per square foot has slightly increased over the 1967 value and is considered to be normal for this operation. The chemical requirement of the sludge--lime at 8.1% and ferric chloride at 3.0%--were slightly higher than normal and lower than in 1967. However, this can be attributed to the unusual characteristics of this sludge.

A total of 65 lbs. of polyelectrolyte was required to filter 30.08 tons. If lime and ferric chloride had been used, an additional 5,000 pounds of these chemicals would have been required, resulting in additional haulage costs.

TD
367
.A56
P676
1968

Port Dover : water pollution control plant.

81240

NLR 176

CONCLUSIONS

During 1968, the Port Dover plant produced an effluent that met or exceeded the design expectations for a primary plant. However, the effluent did not meet the Ontario Water Resources Commission objectives of 15 mg/l for both BOD and suspended solids at all times.

More experimentation with polyelectrolytes for vacuum sludge filtration produced favourable results with a substantial reduction in the unit cost.

Reducing the volume and weight of the lime and ferric chloride formerly used will also lower sludge haulage costs.

It has not been possible, however, to use polyelectrolytes under all circumstances.

Water management in Ontario